



Rediscovery of *Bostryx voithianus* (Pfeiffer, 1847) (Gastropoda, Pulmonata) in northern Chile, with notes on the type locality

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Abstract

Bostryx voithianus (Pfeiffer, 1847) is reported, for the first time since its description, from northern Chile. In the original description, a particular type locality was not given for this species, but to it was described as collected in Chile by Thomas Bridges for the Hugh Cuming collection. Herein, the type locality is assigned to the Chilean Coastal Range between the places Cuesta La Arena (28.5721° S) and Quebrada Honda (29.5952° S), northern Chile.

Key words

Atacama; Coquimbo; land snails; Bulimulidae; arid zones; lomas formations.

Academic editor: Leonardo Souza | Received 22 June 2017 | 13 October 2017 | Published 22 December 2017

Citation: Martínez E (2017) Rediscovery of *Bostryx voithianus* (Pfeiffer, 1847) (Gastropoda, Pulmonata) in northern Chile, with notes on the type locality. Check List 13 (6): 1125–1129. <https://doi.org/10.15560/13.6.1125>

Introduction

Within the group of *Bostryx* species described from Chile, *Bostryx voithianus* (Pfeiffer, 1847) has a particular and rather complex story. This species was originally described as *Bulimus voithianus* Pfeiffer (1847: 114) based on specimens, collected by Thomas Bridges, in the Hugh Cuming collection, now in the Natural History Museum, London (NHMUK).

In June 1848 in his *Conchologia Iconica*, Reeve (1848–1850: pl. 21 fig. 131) described the same species, also based on material from the Cuming collection, as *Bulimus meridionalis*. Reeve points remarked that “It is a very singular species, which appears to have escaped the vigilant search of both Cuming and d’Orbigny. It is very unlike any other Chilean species”. Afterwards, in December 1848 in the same publication, Reeve (1848–1850: pl. 56, fig. 370) illustrated and described *B. meridionalis* Pfeiffer, 1848, a South African species. Finally, in 1850 in the index to this volume of *Conchologia Iconica*, after

recognizing that *Bulimus meridionalis* Reeve, 1848 had been previously described by Pfeiffer (1847), Reeve emended the name assigned to the specimen shown in plate 21, figure 131 to *B. voithianus* (Breure and Ablett 2014).

Hupé (1854) introduced a new name, *Bulimus festhamelii* Hupe, 1854, for *B. meridionalis* Reeve, 1848, also by considering that the specific epithet *meridionalis* had been previously used by Pfeiffer (1848) for the South African species mentioned earlier.

In this way, in a just few years, *Bostryx voithianus* was described with 3 different names. However, despite its hectic story, its type locality was never specified, and it was referred to just as “found in Chile”.

Methods

In December 2014, the author made an expedition all along the coastal zone of the Coquimbo, Atacama, and Antofagasta regions (northern Chile, between 22.2° S

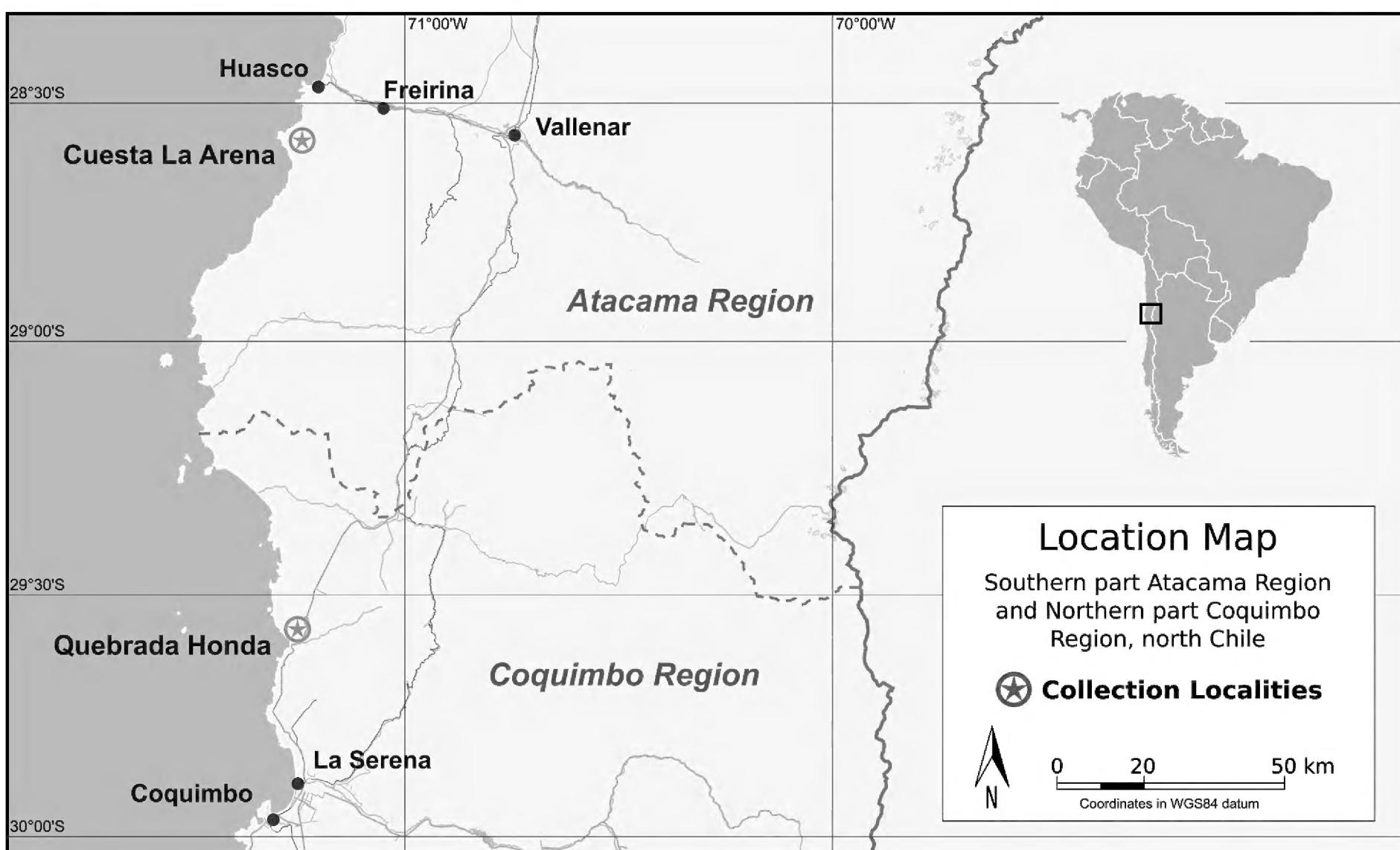


Figure 1. Map of the northern part of Coquimbo Region and southern part of Atacama Region (northern Chile), showing the localities where *Bostryx voithianus* specimens were collected (Cuesta La Arena and Quebrada Honda).

and 30.0° S) with the purpose of collecting specimens of land snails at their type localities. This expedition made it possible to obtain representative material of the various taxa described in the 19th century from northern Chile. Seven empty shells of *Bostryx voithianus* were collected in 2 of the localities visited (Table 1). Both places are situated in the Chilean Coastal Range and correspond to fog oasis locations or lomas formations (Fig. 1). The lomas formations are fog-watered vegetation patches, distributed along the coastal desert of Peru and northern Chile, for nearly 3500 km (Dillon 2005).

The studied material is deposited in the Collection of Malacology of the National Museum of Natural History, Santiago de Chile (MHNCL) (Table 1).

Results

New records. Table 1.

Bostryx voithianus seems to be a rare species, based on the few number of specimens found. These were collected among and under stones, in rocky areas near the coast (Figs 2–4), at altitudes between 180 and 280 m above sea level.

Bostryx voithianus is one of the most characteristic species of the non-marine Chilean malacofauna. Its unique characteristics makes it quite different from the other *Bostryx* species described for Chile and, therefore, clearly identifiable.

The present identification was made by comparing the collected specimens (Figs 5–15), with the lectotype NHMUK 20100565.1 photo (Breure and Ablett 2014: 208, figs 10A, B, L65v) and the original description by Pfeiffer (1847).

The diagnostics characteristics of this species are its fusiform shape, conic spire and acute apex, along with a particular ornamentation, consisting of obtuse scales formed by the intersection of axial wrinkles and spiral grooves (Fig. 6). These characteristics, combined with its dull-white color and the aperture interior stained with deep purple-red (Fig. 5), makes this species easily recognizable.

To the naked eye, the protoconch looks smooth; on magnification, it shows a very delicate microsculpture consisting of a faint but dense set of spiral striations, along with a set of weak axial wrinkles. The protoconch sculpture is easily lost in worn shells.

Table 1. List of localities where the author found *Bostryx voithianus* specimens in December 2014. Geographic coordinates in WGS84 datum.

Locality	Administrative division	Latitude (°S)	Longitude (°W)	Altitude (m)	Vouchers	
					MHNCL no.	No. of shells
Cuesta La Arena (site 1)	Atacama Region (Chile)	28.5721	071.2798	280	203134	3
Cuesta La Arena (site 2)	Atacama Region (Chile)	28.5750	071.2789	220	203135	3
Quebrada Honda	Coquimbo Region (Chile)	29.5952	071.2759	180	203136	1



Figures 2–4. General views showing the landscape and vegetation of the localities where *Bostryx voithianus* specimens were collected. **2.** Cuesta La Arena, site 1 (280 m a.s.l.). **3.** Cuesta La Arena, site 2 (220 m a.s.l.). **4.** Quebrada Honda (180 m a.s.l.)

Bostryx breuri Araya, 2015, a recently described new species, share some characteristic with *B. voithianus*. Both species are distinguished by a fusiform shell having an acute conic spire and a conspicuous shell sculpture of crossed axial and spiral lines, defining the obtuse scales aforementioned. On the other hand, *B. breuri* has a thin and fragile shell, while *B. voithianus* shell is definitely solid, and the aperture interior is stained deep purple-red.

The type locality of *Bostryx breuri* is Quebrada del León (northern part of the Atacama Region, at latitude 26.9583° S and longitude 070.7390° W), approximately

190 km north of Cuesta La Arena (the northernmost known locality of *B. voithianus*). Both species were collected in a similar habitat.

Discussion

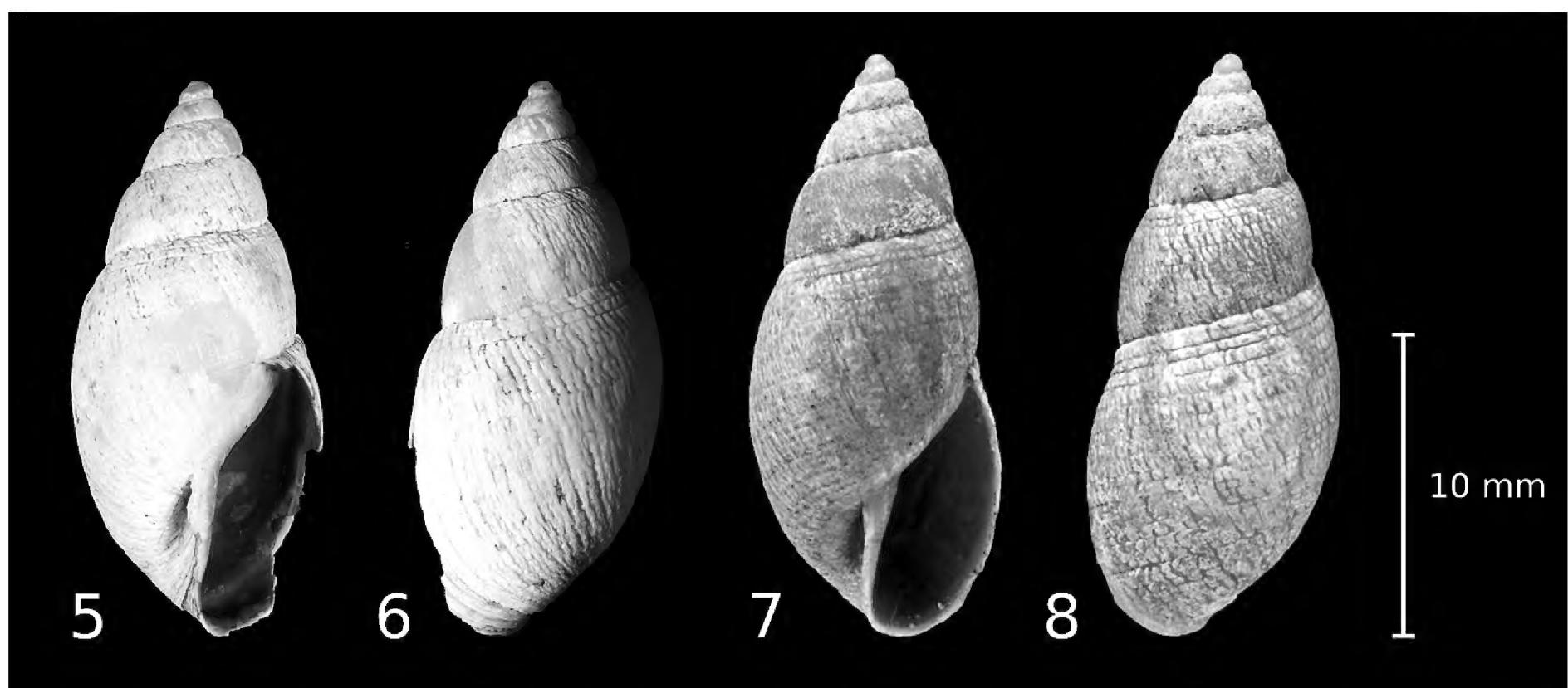
The relevance of this research lies in the rediscovery, after 170 years, of one of the more characteristic species of Chilean land snails. In the literature, there are no other specimens mentioned other than those collected by Bridges. Therefore, the 4 specimens (1 lectotype and 3 paralectotypes, designated by Breure and Ablett 2014: 208; Cuming collection, NHMUK) are the only known specimens of this species so far.

Pfeiffer (1847) described a mixed series of 38 species of land snails from the Cuming collection. Seven of the species described come from unknown localities, while the other 31 come from widely dispersed, unrelated locations such as Greece, Tahiti, Philippines, New Guinea, Mauritius, Madagascar, Cuba, Jamaica, Mexico, Colombia, Bolivia, Archipelago of Juan Fernández (Chile), and continental Chile. Within this group, there are 3 species collected by Thomas Bridges, 2 of them coming from Bolivia (*Bulimus draparnaudi* Pfeifer, 1847 and *B. porphyrius* Pfeiffer, 1847), and 1 from Chile (*B. voithianus*), the latest without a particular locality. The 2 Bolivian species could have been collected during the trip made by the naturalist to Bolivia during 1845 (Dall 1866: 236), but the Chilean species seems to have a previous origin. Before that, Pfeiffer (1843) had published the description of 7 species of land snails, also coming from the Cuming collection and collected by Thomas Bridges in northern Chile (Table 2).

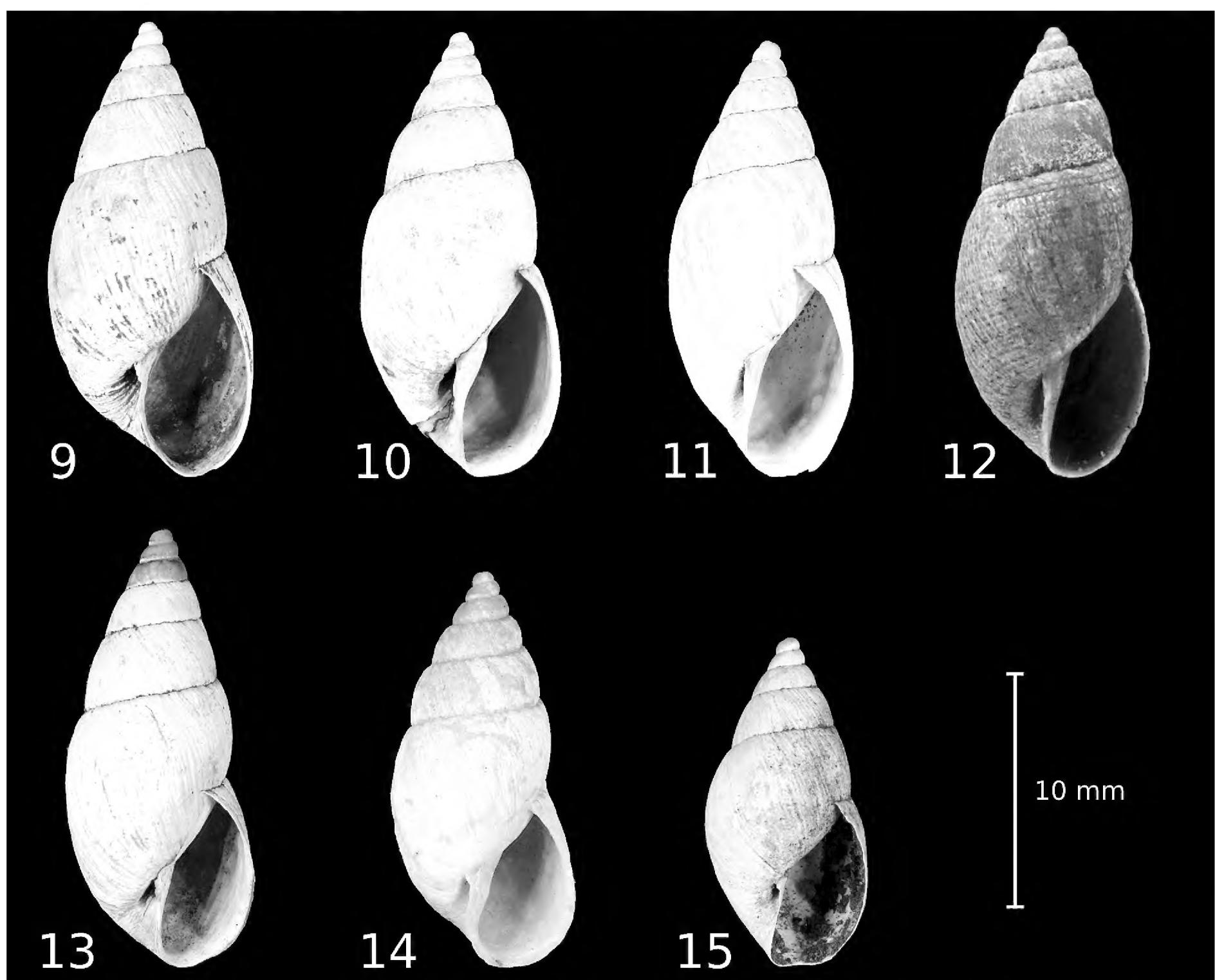
Based on the type localities of the collected species, it is possible to infer that the route followed by Bridges corresponds to the coastal road between the ports of Coquimbo and Huasco. The same trail was travelled by Charles Darwin in 1835, some years before the expedition made by Bridges (Darwin 1846). If indeed Bridges took this road, he would have passed by the lower zone of Quebrada Honda, while Cuesta La Arena corresponds to one of the localities where Bridges collected 2 of the species described by Pfeiffer (1843).

According to Recommendation 76A.1. of the International Code of Zoological Nomenclature (ICZN 1999), concerning to “In ascertaining or clarifying a type locality...”, and in particular with Recommendation 76A.1.4. that states that “as a last resort [to ascertain a type locality], and without prejudice to other clarification, localities within the known range of the taxon or from which specimens referred to the taxon had been taken”, it is now proposed to assign the type locality of *Bostryx voithianus* to the Chilean Coastal Range between Cuesta La Arena and Quebrada Honda localities, northern Chile.

It is possible that *Bostryx huascensis* (Reeve, 1848), based on material collected by Thomas Bridges in Huasco, had also been collected along with *B. voithianus* and the other taxa listed in Table 2 during the same



Figures 5–8. Comparison between Quebrada Honda specimen (MHNCL 203136) and *Bostryx voithianus* lectotype (NHMUK 20100565.1). The height of the shell (H) is indicated for each specimen. **5.** Quebrada Honda specimen (MHNCL 203136), ventral view (H = 18.2 mm). **6.** Quebrada Honda specimen (MHNCL 203136), dorsal view. **7.** Lectotype (NHMUK 20100565.1), ventral view (H = 19.1 mm). **8.** Lectotype (NHMUK 20100565.1), dorsal view.



Figures 9–15. Comparison between Cuesta La Arena specimens (MHNCL 203134-203135) and *Bostryx voithianus* lectotype (NHMUK 20100565.1). The height of the shell (H) is indicated for each specimen. **9.** Cuesta La Arena (site 1) specimen (MHNCL 203134), H = 19.3 mm. **10.** Cuesta La Arena (site 1) specimen (MHNCL 203134), H = 18.5 mm. **11.** Cuesta La Arena (site 1) specimen (MHNCL 203134), H = 18.8 mm. **12.** Lectotype (NHMUK 20100565.1), ventral view (H = 19.1 mm). **13.** Cuesta La Arena (site 2) specimen (MHNCL 203135), H = 18.6 mm. **14.** Cuesta La Arena (site 2) specimen (MHNCL 203135), H = 16.7 mm. **15.** Cuesta La Arena (site 2) juvenile specimen (MHNCL 203135), H = 14.0 mm.

Table 2. List of species collected by Thomas Bridges in northern Chile and described by Pfeiffer (1843). Habitat according Bridges's original observation. *Plectostylus* current systematic position according Valdovinos and Stuardo (1988), *Bostryx* and *Chiliborus* current systematic position according Stuardo and Vega (1985)

Pfeiffer's species	Current systematic position (*)	Type locality	Habitat (Bridges)
<i>Bulimus bridgesii</i>	<i>Chiliborus bridgesii</i> (Pfeiffer, 1842)	Frierina (Atacama, Chile)	Under stones
<i>Bulimus pachychilus</i>	<i>Chiliborus pachychilus</i> (Pfeiffer, 1842)	Cuesta La Arena (Atacama, Chile)	Buried in sand
<i>Bulimus rhodacme</i>	<i>Bostryx rhodacme</i> (Pfeiffer, 1843)	Frierina (Atacama, Chile)	Under small cacti
<i>Bulimus terebralis</i>	<i>Bostryx ischnus</i> (Pilsbry, 1902)	Coquimbo (Coquimbo, Chile)	On rocks and plants near the sea
<i>Succinea elegans</i>	<i>Plectostylus elegans</i> (Pfeiffer, 1842)	Cuesta la Arena (Atacama, Chile)	On a species of <i>Juncus</i>
<i>Succinea reflexa</i>	<i>Plectostylus reflexus</i> (Pfeiffer, 1842)	Pichidangui (Coquimbo, Chile)	On leaves of <i>Pourretia coarctata</i> (= <i>Puya chilensis</i> Molina)
<i>Succinea variegata</i>	<i>Plectostylus variegatus</i> (Pfeiffer, 1842)	Valleys north of Coquimbo (Coquimbo, Chile)	Found in crevices of rocks

expedition. Probably, this taxon was not previously described by other authors who usually worked with the Cuming collection, due to its similarity with *B. albus* (Sowerby, 1833), a species that also inhabits the zone of Huasco (Pilsbry 1895–1896).

Acknowledgements

I want to thank to A.S.H. Breure (Naturalis Biodiversity Center, Leiden, The Netherlands) who reviewed the first version of the manuscript, made useful comments and helped me to improve it. Also, I am thankful to the associate editor and the anonymous reviewers, who by their valuable suggestions and comments significantly improved this manuscript.

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